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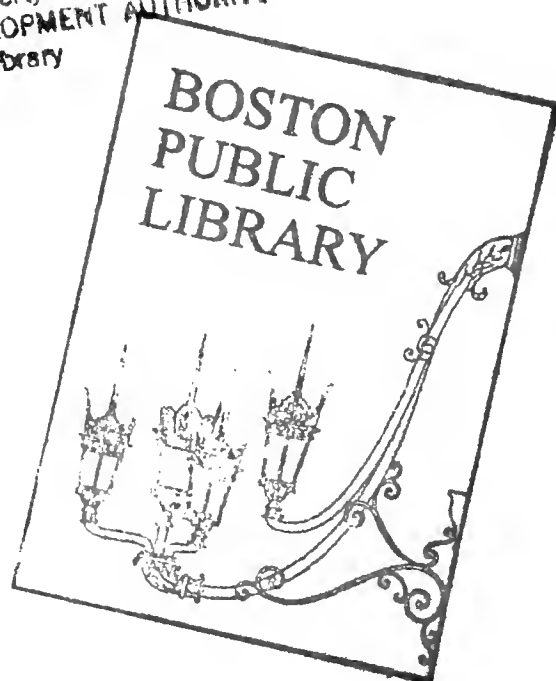
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ECONOMIC STUDY OF THE PROPOSED
Government Center Garage

BOSTON, MASSACHUSETTS

Prepared for:

SAMUEL GLASER ASSOCIATES, ARCHITECTS

KALLMANN AND McKINNELL

REAL PROPERTY DEPARTMENT, CITY OF BOSTON

September, 1965

CONSULTANT BARTON-ASCHMAN ASSOCIATES, CHICAGO, ILLINOIS

CONTENTS

List of Figures, v	
List of Tables, vii	
Summary, ix	

1.	
INTRODUCTION	1

Purpose and Scope	1
Characteristics of the Area	3
Description of the Garage	3
Study Procedure	6

2.	
CURRENT PARKING CONDITIONS AND CHARACTERISTICS	9

Existing Parking Facilities	9
Travel Characteristics of Employees and Visitors	11

3.	
ECONOMIC ANALYSIS OF PROPOSED GARAGE	15

Anticipated Developments in the Trade Area	15
Estimated Parking Needs	18
Projected Parking Supply	20
Estimated Garage Use	24
Economic Analysis	25

4.	
NON-PARKING GARAGE USES	29

Bus Terminal	29
Accessory Uses	29

LIST OF FIGURES

1. Area Map	2
2. Study Area	4
3. Proposed Government Center Garage	5
4. Inventory of Existing Parking	10
5. Projected Development of Buildings	16
6. Employment Projections	21
7. Projected Inventory of Parking	22
8. Proposed Bus and Transit Operation	30

LIST OF TABLES

1. Current Inventory of Parking Space in Study Area	9
2. Trip Purpose of Temporary Lot Parkers	12
3. Walking Distance and Trip Purpose of Temporary Lot Parkers	12
4. Duration of Stay and Trip Purpose of Temporary Lot Parkers	12
5. Employee and Visitor Travel Characteristics	13
6. Employment and Visitor Projections	17
7. Travel Characteristics Related to Construction Stages	19
8. Estimated Competitive Parking in Trade Area, 1967 to 1985	23
9. Estimated Garage Use, 1967-1985	24
10. Rate Schedule for Proposed Garage	25
11. Estimated Gross Revenues	26
12. Estimated Annual Revenue and Costs	27
13. Estimated Development Cost	28
14. Economic Summary for 1967 and 1970	28

SUMMARY

THIS STUDY was conducted for Samuel Glaser Associates, Architects, and Kallmann and McKinnell, pursuant to an agreement with the Real Property Department, City of Boston, Commonwealth of Massachusetts. The basic purpose is the examination of the economics of building and operating the proposed 2,000-space parking garage in the Government Center area.

As a basis for the study, a number of investigations were carried out to collect the necessary factual background. Included in this phase were parking field surveys, interviews with persons typical of those who will be using the garage, compilation and analysis of announced development plans, and a review of previously collected and published data pertinent to the project.

It is estimated that by 1967, 10 buildings within Government Center will be occupied by 19,950 employees. In addition, there will be an estimated 20,350 persons visiting the buildings each day. By 1970, these estimates will have increased by 6,600 employees and 6,000 visitors.

It is estimated that in 1967 the daily parking demand generated by the buildings will amount to 2,510 employee and 2,500 visitor vehicles. By 1970, the estimated demand will have increased to 3,550 employee parkers and 3,300 visitor parkers.

When anticipated competing parking space is considered, it is estimated that 3,270 parkers will use the proposed garage each day by 1967, and 3,460 by 1970.

The economic analysis of the proposed garage indicates that its development would be a sound venture that can be expected to be self-liquidating.

Estimated debt coverage is expected to be 1.41 in 1967 and increase to 1.66 by 1970. Corresponding annual surplus is estimated at \$206,000 in 1967 and \$330,000 by 1970.

1

INTRODUCTION

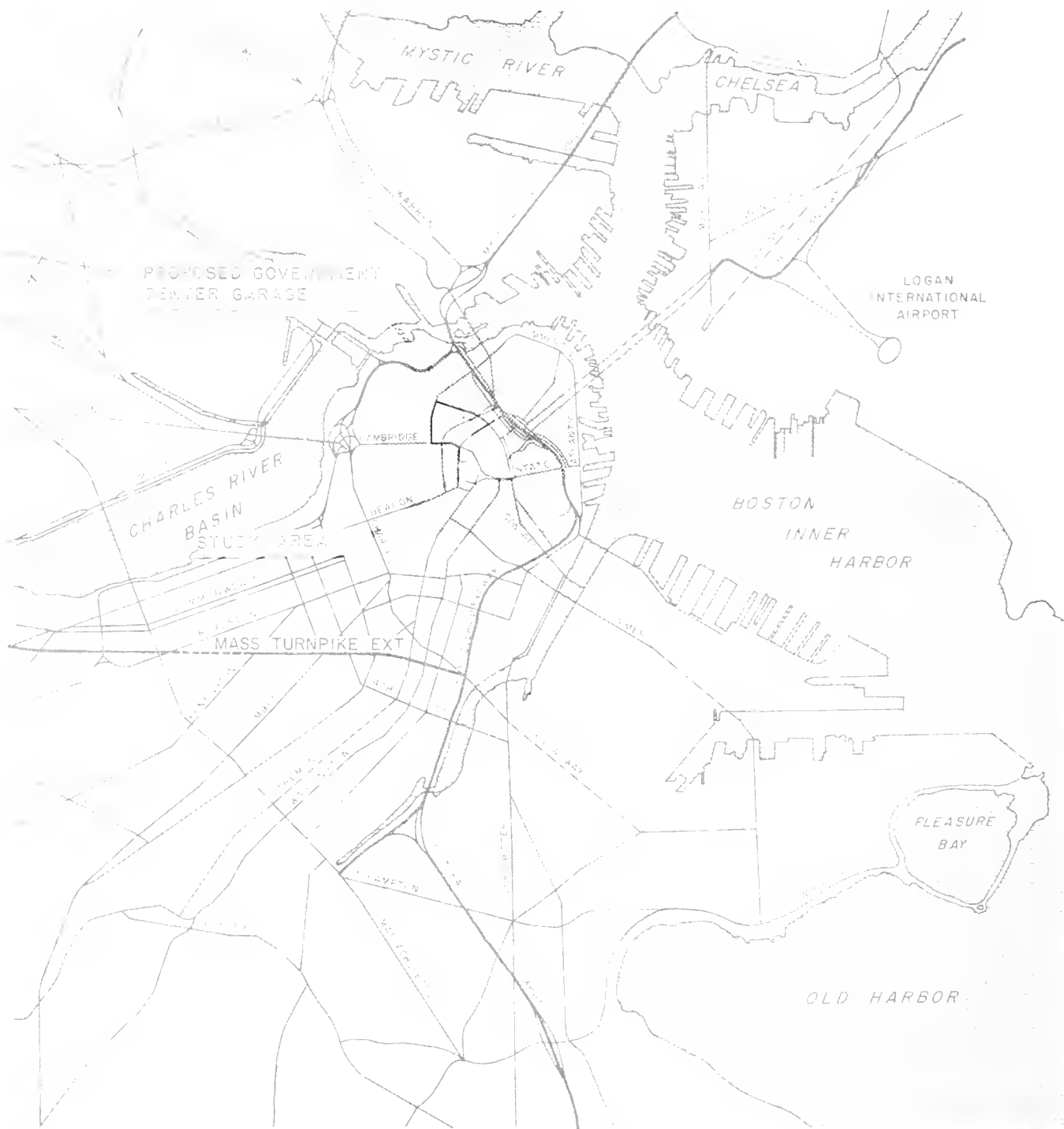
PURPOSE AND SCOPE

WORK IS proceeding on the construction of the Government Center development in the Central Area of Boston. Ultimately, this complex will contain approximately 34,000 employees and attract more than 32,000 visitors per day. By the end of 1967, it is anticipated that almost 20,000 persons will be employed in the area and that more than 20,000 visitors will be attracted to the numerous offices, both public and private. Although a number of buildings in Government Center will provide nominal amounts of parking space, the principal source of parking in the area--to serve both visitors and employees--will be the proposed Government Center Garage to be constructed on parcel four in the project. The garage will contain approximately 2,000 parking spaces and will, in addition, house the bus operations (terminal) which currently are focused at Haymarket Square.

The basic purpose of this study is to examine the economics of building and operating the proposed parking garage in Government Center. In this study future conditions affecting parking in the garage were evaluated and the expected usage and revenues were estimated. Corollary assignments included a general evaluation of the bus terminal and potential accessory uses in the proposed garage.

This study was conducted for Samuel Glaser Associates, Architects, and Kallmann and McKinnell, pursuant to an agreement with the Real Property Board of the City of Boston, Commonwealth of Massachusetts, dated October 30, 1964.

The proposed Government Center Garage will be served by the road system which provides access to the Central Area. Figure 1 shows the relationship of the garage to the surrounding area and the roadnet which will provide access to it.



AREA MAP



CHARACTERISTICS OF THE AREA

The proposed garage will be located near the centroid of Government Center. The study area for this investigation was designed to encompass an area corresponding roughly to the primary trade area of the garage and is bounded, as shown in Figure 2, by Staniford and Bowdoin on the west, by Causeway on the north, by John F. Fitzgerald Expressway on the east, and by Court and State Streets on the south.

The primary trade area of the garage is adjacent to the Central Business District, the meat and produce market area, and the wholesale furniture district.

Because of the proximity of Government Center to these important Central Area activities, the study area boundaries, as shown in Figure 2, have been extended beyond the anticipated primary trade area of the proposed garage. It was deemed worthwhile to investigate parking supply and use around the perimeter of the primary trade area in order to determine whether parking facilities located in this area could logically provide strong competition to the proposed Government Center Garage.

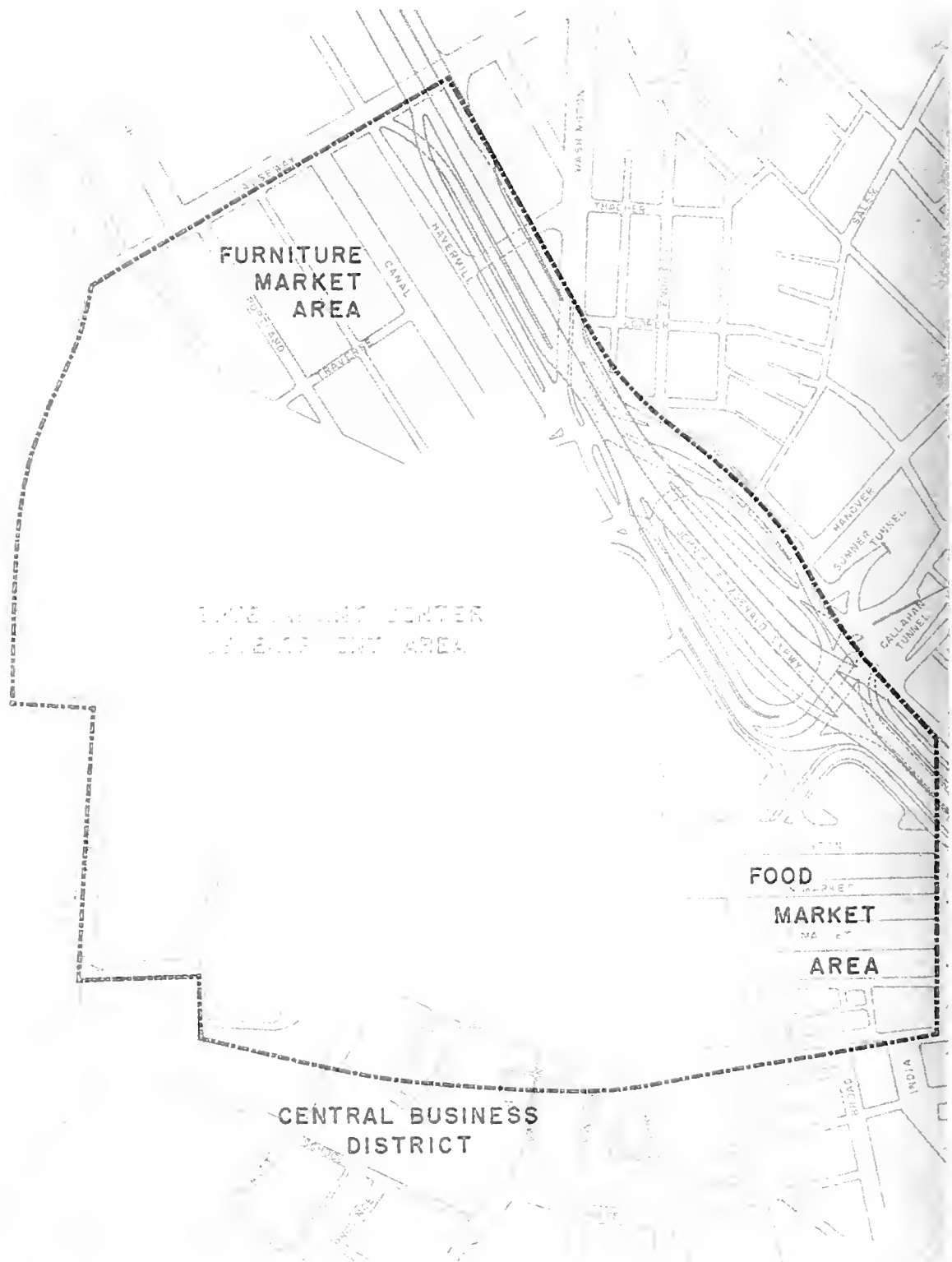
DESCRIPTION OF THE GARAGE

The garage, as shown in schematic perspective in Figure 3, will have a capacity of approximately 2,000 parking spaces. It will be located on a site bounded by New Sudbury Street on the south, by Blackstone Street on the east, and by New Chardon Street on the north. The site is bisected, at an angle, by Merrimac-New Congress Street into unequal parcels with the MBTA subways running beneath the parcel east of Merrimac-New Congress.

A self-parking type of operation is contemplated for the garage. Under this system, the patron is issued a ticket upon entry and pays the fee upon leaving.

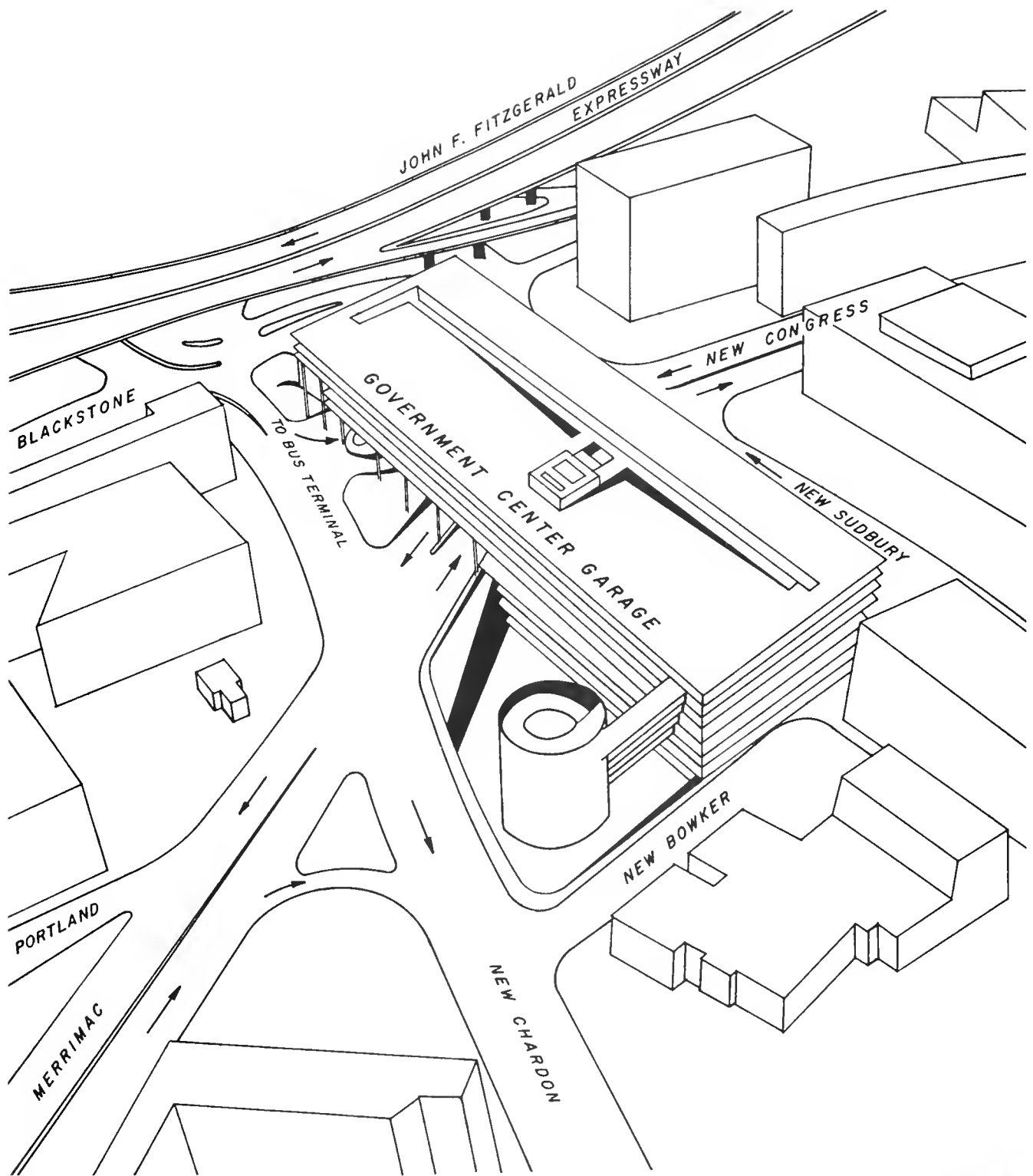
The basic design of the garage provides for three, 62-foot wide parking bays running east and west and paralleling New Sudbury Street. These bays will be separated by light walls nine feet wide. The upper five levels will span New Congress Street and provide a shelter for the pedestrian concourse, a bus station, and the entry to the Haymarket and Union-Friend Subway Stations. The lower four levels will be constructed only on the portion of the site which is west of New Congress Street.

Access to the garage will be provided on New Sudbury



STUDY AREA





PROPOSED GOVERNMENT CENTER GARAGE



Street, west of New Congress Street; on New Chardon Street, west of New Congress Street; on New Chardon Street, east of New Congress Street, and on New Congress Street for north-bound traffic. The entrance system will accommodate traffic approaching the garage from any direction.

Circulation through the garage will be accomplished by ramp parking floors on a five percent grade. Parking stalls will be located at an angle of approximately 78 degrees to the line of travel and will be nine feet wide. Headroom in the structure will be seven feet clear, minimum, with the general floor to ceiling height being eight feet, six inches.

There will be two exit systems. The first will utilize the parking ramps described in the previous paragraph. This method will allow for both parking and descent through the garage. The second, or express, exit system will utilize a spiral ramp 18 feet wide and 84 feet in diameter connected to each level and located, as indicated in Figure 2, in the northwest corner of the site.

Pedestrian circulation will utilize a centrally located bank of four passenger elevators which will link all floors with the pedestrian lobby situated on the west side of New Congress Street. Glass-enclosed stairs will link the pedestrian lobby with the immediately adjacent floors above and below the entry level. The pedestrian lobby will be located equidistant to all destinations north and south in the Government Center. Escape stairs will be provided in remote locations.

The structure, including the exit and entrance spirals, will be constructed of reinforced concrete cast in place. Mechanical ventilation of the garage is not contemplated because of the free movement of air through the light walls which support the parking bays. Mercury vapor lamps will be used for illumination.

STUDY PROCEDURE

Since the basic purpose of this study is to examine the economics of the proposed Government Center garage, it was necessary to determine the number of employees expected to be concentrated in Government Center and to estimate the number of visitors who would be attracted to the various offices. In addition, it became necessary to define the travel characteristics of these future employees and visitors.

Although parking field investigations can provide a partial basis for defining the habits of potential parkers, they

do not provide an adequate basis to identify travel characteristics of these persons. Therefore, the research for this study included both extensive field investigations in, and adjacent to, the garage site and the compilation of additional data on travel characteristics.

The principal parking field surveys were conducted during the winter of 1964. These field studies included an inventory of facilities as well as occupancy counts to identify such points as location, capacity, rate structure, and the probable permanency of each facility and its normal use. Concurrently, interviews were conducted at several parking facilities in the trade area, to obtain parking characteristics such as purpose of trip, walking destination, and duration of stay.

Next, data to identify travel characteristics were collected from employees representative of those who will be working in Government Center upon its completion. In total more than 3,500 persons employed (or who will be employed) in five buildings, including those which exist and which are planned for Government Center, were interviewed. These interviews provided a basis for establishing such factors as mode of travel, type of parking presently used (if the employee drove to work), an indication of the employee's willingness to pay, and acceptable walking distances. Information of this nature was gathered from questionnaires distributed as part of the study and were supplemented by pertinent facts gathered by the federal government in connection with its building program planning.

Additional investigations which were made as part of the study included the following:

1. Review of previous studies and reports relating to parking and travel characteristics in the proposed Government Center area.
2. Interviews with officials of the Boston Redevelopment Authority (in order to obtain information regarding the ultimate development of the project).
3. Collection of data concerning transit facilities, patronage, and interchanges at the proposed stations within the study area.
4. Interviews conducted at certain representative buildings to determine travel characteristics of visitors.

5. Investigation of the feasibility of providing accessory uses (or nonparking uses) in the garage.

The basic procedures followed in the conduct of this study included the following five steps:

1. Through parking field studies and an analysis of existing conditions and the changes which are anticipated within the area, the need for parking at the present time and for several future years (1967, 1970, and 1985) was evaluated.
2. To the extent possible, future development plans were quantified to determine the number of employees and visitors anticipated during these future years.
3. Based on the quantifications of future parking needs for the years 1967, 1970, and 1985, and modified by anticipated changes in the parking supply, the number of parking spaces required to serve the trade area was estimated. Potential garage use was then estimated.
4. A competitive rate structure was assumed and revenues were estimated for the facility. These, in turn, were compared with the capitalized development costs and anticipated annual maintenance and operating costs.
5. Revenue estimates for possible accessory (nonparking) uses were estimated. Future bus terminal operations within the parking facility were evaluated.

In December, 1964, the preliminary findings of the study were summarized in a report which was submitted to the various agencies concerned with the Government Center project for review and criticism. The comments and suggestions resulting from this review have been incorporated into the present report.

2

CURRENT PARKING CONDITIONS AND CHARACTERISTICS

EXISTING PARKING FACILITIES

THE FIELD SURVEY conducted in November, 1964 disclosed that there were a total of 1,963 off-street parking spaces within the primary and secondary trade areas of the garage. In addition, there were 330 on-street spaces. The Government Center area was already under construction at that time and many of the previously existing streets and buildings had been demolished. As a result, temporary parking facilities were being operated on a number of parcels of land. These interim parking facilities were evaluated in order to determine their probable future impact on proposed parking facilities.

The nature of the 1,963 off-street parking spaces within the primary and secondary trade areas of the garage are summarized in Table 1, and the location is shown in Figure 4.

Table 1
CURRENT INVENTORY OF PARKING SPACE IN STUDY AREA

	Permanent	Number of Spaces	
		Temporary	Total
<u>Off-street</u>			
Commercial Hourly and Daily Fee Lots	306	876	1,182
Municipal Lots (under expressway)	450		450
Private Lots	160		160
Other		171	171
Total:	<u>916</u>	<u>1,047</u>	<u>1,963</u>
<u>On-street</u>			
Free Curb	330		



INVENTORY OF EXISTING PARKING

PERMANENT

TEMPORARY

CURB PARKING

BARTON-ASCHMAN ASSOCIATES



FIGURE 4

Approximately 53 percent of the spaces are temporary and will, therefore, be replaced by other land-uses when the Government Center development has been completed. Only a small proportion--about 10 percent--of the existing spaces are vacant during a normal weekday. Because it is possible that many of the parkers who will be displaced from the temporary parking facilities may become potential users of the Government Center garage, interviews were conducted in three temporary lots having a total capacity of 366 spaces. The results of these interviews are summarized in Tables 2, 3, and 4. As noted in Table 2, the majority of these parkers visited the area to work (64 percent) or for business purposes (26 percent) with less than 10 percent of them visiting the area to shop or for other purposes.

Patrons of the temporary lots walked a relatively short distance to reach their destinations. (See Table 3.) More than half of these parkers walked less than two blocks. The temporary lots were located within two blocks of the destination of 65 percent of the employees, 63 percent of the shoppers, and 60 percent of persons making business trips. It will be noted that shoppers walked the greatest distance, but since this class of parker represented less than five percent of all the parkers using temporary lots, its effect is relatively inconsequential.

As would be expected, the duration of stay of various parkers in the temporary lots varied according to purpose of trip. The majority of employees remained more than six hours; whereas 75 percent of the shoppers stayed less than one hour, and 65 percent of the persons on business trips remained less than two hours. The figures relating duration of stay to trip purpose, as summarized in Table 4, provided a guide in helping to determine the average turnover that may be expected in the proposed Government Center garage.

Approximately one-half of the permanent off-street space within the trade area consists of public parking lots beneath the John F. Fitzgerald Expressway. As shown in Figure 4, 450 such spaces exist.

TRAVEL CHARACTERISTICS OF EMPLOYEES AND VISITORS

In order to define the travel characteristics of potential Government Center employees and visitors, interviews were conducted with persons typical of those who will visit the area in future years. A summary of the results of more than 9,000 interviews is shown in Table 5. Between 11 and 33 percent of the typical employees currently drive to work. It should be noted that the percentages shown in Table 5 for

Table 2
TRIP PURPOSE OF TEMPORARY LOT PARKERS

Purpose	Percent
Work	64.3%
Shop	4.5
Business	26.2
Other	5.0
Total:	100.0

Table 3
WALKING DISTANCE AND TRIP PURPOSE OF TEMPORARY LOT PARKERS

Distance (blocks)	Purpose (percent)			
	Work	Shop	Business	Other
0-1	49.1%	37.5%	28.0%	28.6%
1-2	15.8	25.0	32.4	-
2-4	17.5	12.5	18.6	28.6
4-6	13.2	-	7.0	28.6
6-8	2.6	-	7.0	14.2
Over 8	1.8	25.0	7.0	-
Total:	100.0	100.0	100.0	100.0

Table 4
DURATION OF STAY AND TRIP PURPOSE OF TEMPORARY LOT PARKERS

Duration	Purpose (percent)			
	Work	Shop	Business	Other
Less than 30 Min.		37.5%	13.5%	11.1%
30 Min. to 1 Hour	3.2%	37.5	25.0	11.1
1 to 2 Hours	4.8	-	26.9	11.1
2 to 4 Hours	9.5	-	23.1	44.5
4 to 6 Hours	17.4	12.5	5.8	22.2
6 to 8 Hours	24.6	12.5	3.8	-
Over 8 Hours	40.5	-	1.9	-
Total:	100.0	100.0	100.0	100.0
Average (hour)	6.21	1.97	2.07	2.75

Table 5
EMPLOYEE AND VISITOR TRAVEL CHARACTERISTICS

Building or Agency	Employees Interviewed	Percent Driving	Parking (1)		Percent Pub- lic Trans- portation	Per- cent Other
			Percent Pay	Percent Free		
State Agencies (2)	2,117	26%	(12)%	(14)%	56%	18%
City Hall (2)	894	17	(10)	(7)	72	11
VA Building (2)	179	10	(8)	(2)	71	19
Telephone Co. (2)	277	33	(9)	(24)	55	12
Ames Building (2)	93	18	(17)	(1)	64	18
Federal Offices (3)	3,155	11	-	-	83	6
Visitors Interviewed at Various Buildings(4)	5,611	10	10	-	78	12

(1) Expressed as percent of total employees interviewed.

(2) Based on interviews made during this study.

(3) Based on extensive memorandum survey made by federal government in 1964.

(4) Includes 1,410 interviews made during this study and 4,201 from the federal survey of 1964.

those paying and parking free, represent percentages of total employees interviewed and, therefore, the percent of persons paying and those parking free when added together equal the percentage driving. For example, 12 percent of the state agency employees pay to park and 14 percent park free, so that the total number of employees from state agencies who drive to work equals 26 percent.

With respect to visitors, approximately 10 percent are automobile drivers and almost all of these persons pay for parking space. The proportion of visitors who drive ranges between eight and 23 percent and varies according to the specific building visited. Employees who drive to the area early in the day fill most of the free space so that visitors who arrive throughout the day must use commercial facilities. In certain cases, the interviews indicated a high percentage of visitors who drove, but it should be emphasized that a relatively large number of such trips were multi-purpose. The number of multi-purpose trips has been considered in the subsequent estimates.

3

ECONOMIC ANALYSIS OF PROPOSED GARAGE

ANTICIPATED DEVELOPMENTS IN THE TRADE AREA

THE PRINCIPAL need for parking space in the Government Center area will be generated by the proposed development. Projected activity in the area is shown in Figure 5 and the number of employees and visitors expected to be generated by this development is summarized in Table 6.

Between New Chardon and New Sudbury, six buildings will be completed by 1970. These include the existing Telephone Company and Welfare Agency buildings and four new buildings. The portion of Government Center lying between New Sudbury and Court Streets will contain the new Federal Office Building, the new City Hall, three new office buildings, and the rehabilitated Sears Crescent Building. These facilities will be completed and occupied within the next five years.

North of New Chardon, the state service center will be in operation between 1967 and 1970. In addition, as shown in Figure 5, several private office buildings and state office buildings will be completed and occupied by 1970.

In total, it is anticipated that within the next two years--or by 1967--19,950 employees will be concentrated near the proposed garage. The offices containing these employees are expected to attract about 20,350 visitors each day.

By 1970, it is estimated that employment within the area will increase by 6,600 and that the daily visitor load will increase by 6,000 persons. Growth is placed at 7,400 employees and 6,400 daily visitors by 1985. At that time the total employment is expected to be 33,950 and the daily visitor load approximately 32,750.

The information and projections, as summarized in Figure 5 and Table 6, have been developed in cooperation with the various governmental and private agencies that expect to be



FIGURE 5

Table 6
EMPLOYMENT AND VISITOR PROJECTIONS

		1967	Additional 1967-1970	Additional 1970-1985
State Office Complex	- E	4,200	+ 800	+ 1,000
	- V	3,100	+ 600	+ 700
State Office Building	- E	3,200	+ 600	+ 600
	- V	2,400	+ 500	+ 500
Telephone Company	- E	1,000	-	-
	- V	800	-	-
Federal Office Building	- E	4,200	+ 800	+ 800
	- V	5,800	+ 1,100	+ 1,100
City Hall	- E	1,700	+ 300	+ 500
	- V	1,800	+ 400	+ 400
VA Building	- E	400	-	-
	- V	700	-	-
Ames Building	- E	400	-	-
	- V	350	-	-
Center Plaza	- E	3,400	+ 1,100	-
	- V	2,700	+ 900	-
County Courthouse	- E	1,200	-	-
	- V	2,500	-	-
City Welfare Department	- E	250	-	-
	- V	200	-	-
Proposed Private Office	- E	-	+ 3,000	+ 4,500
	- V	-	+ 2,500	+ 3,700
Total Employees:		19,950	6,600	7,400
Total Visitors:		20,350	6,000	6,400

Note: Federal Office Building visitor projections are based on a study conducted by the federal government for the new office building. Other projections are based on interviews and applications of employee-visitor ratios.

E: Employees.
V: Visitors.

located in the area. These agencies have provided estimates of anticipated completion dates, sizes of buildings, employment, and number of daily visitors.

From present indications, it may be assumed that by 1970 the majority of the buildings planned for Government Center will be either under construction or completed. In connection with the present report, it has been assumed that the ultimate employment in the area will be achieved over a 15-year period between 1970 and 1985. Because of the nature of the agencies to be located in the area, it is likely that the estimates of employment and visitor generation are conservative and could exceed the quantities noted in the previous paragraphs. For example, an expansion of the health and welfare programs and the anti-poverty activities appears to be logical in light of recent federal legislation and continued emphasis in these areas.

ESTIMATED PARKING NEEDS

From an application of anticipated travel characteristics representing the anticipated activities in Government Center, it is possible to estimate the proportion of employees and visitors who will drive to the area and, more specifically, to identify potential Government Center Garage parkers.

Parking needs for the trade area were estimated on an overall or area-wide basis. It is believed that this approach is more appropriate in the present situation than the traditional block-by-block analysis. Although the number of parkers generated by existing development will be of some importance in the future, the principal future parking needs will be related to projected development within the Center.

Anticipated travel characteristics were applied to the number of projected employees and visitors (as related to the anticipated development of Government Center). From this, it has been possible to estimate the number of parkers who would require parking space in 1967, 1970, and 1985.

As summarized in Table 7, it is estimated that by 1967 there will be a daily demand to park 2,510 employee and 2,500 visitor automobiles. During the daily parking peak period (around midday on a typical day) it is estimated that approximately 80 percent of the employees and 35 percent of the visitor automobiles would be present. This proportion of peak period parking would represent 2,010 employee parkers and 870 visitor parkers, or a total of 2,880 spaces in 1967.

It is estimated that by 1970 the need for parking space

Table 7

TRAVEL CHARACTERISTICS RELATED TO CONSTRUCTION STAGES

Building	Percent Employees Driving	Percent Visitors Driving	1967 Autos		1967-1970 Autos		1970-1985 Autos	
			Employee	Visitor	Employee	Visitor	Employee	Visitor
State Office Complex	12%	10%	500	310	600	370	720	440
State Office Building	12	12	380	290	460	350	530	410
Telephone Company	11	10	110	80	110	80	110	80
Federal Office Building	11	8	460	460	550	550	640	640
City Hall	11	20	190	360	220	440	280	520
VA Building	9	20	40	140	40	140	40	140
Ames Building	16	20	60	70	60	70	60	70
Center Plaza	18	15	610	400	810	540	810	540
County Courthouse	11	15	130	370	130	370	130	370
City Welfare Department	11	10	30	20	30	20	30	20
Private Office	18	15	-	-	540	370	1,350	930
Totals:			2,510	2,500	3,550	3,300	4,700	4,160

Potential Peak Parking Demand

1967	Employee Autos:	2,510 x 80%	(peak accumulation) =	2,010
	Visitor Autos:	2,500 x 35%	(peak accumulation) =	870
			Total Peak Demand:	2,880 spaces
1967-1970	Employee Autos:	3,550 x .80	=	2,840
	Visitor Autos:	3,300 x .35	=	1,150
				3,990 spaces
1970-1985	Employee Autos:	4,700 x .80	=	3,760
	Visitor Autos:	4,160 x .35	=	1,460
				5,220 spaces

would increase to a daily peak accumulation of 3,990 spaces. During the entire day, some 3,550 employees and 3,300 visitors would drive to the area.

Projections indicate that during the latter phases of expansion and occupancy in the Government Center area (between 1970 and 1985) the number of vehicles parked in the area throughout a typical day will reach 8,860, including 4,700 employee and 4,160 visitor automobiles. By 1980 the daily peak period parking volume is expected to be 5,220 vehicles.

The amount and location of the projected employment in and adjacent to the Government Center area is shown graphically in Figure 6.

It should be noted that the estimated peak-hour demand for parking space is conservative since these figures have not been adjusted to compensate for the induced travel to the area that may be generated by an improved expressway system. Nor do these figures reflect the growing trend toward more widespread vehicle ownership and a reduction in the number of persons riding per automobile. On the other hand, these factors could be counteracted in future years if the use of rapid transit in travelling to the Government Center area increases.

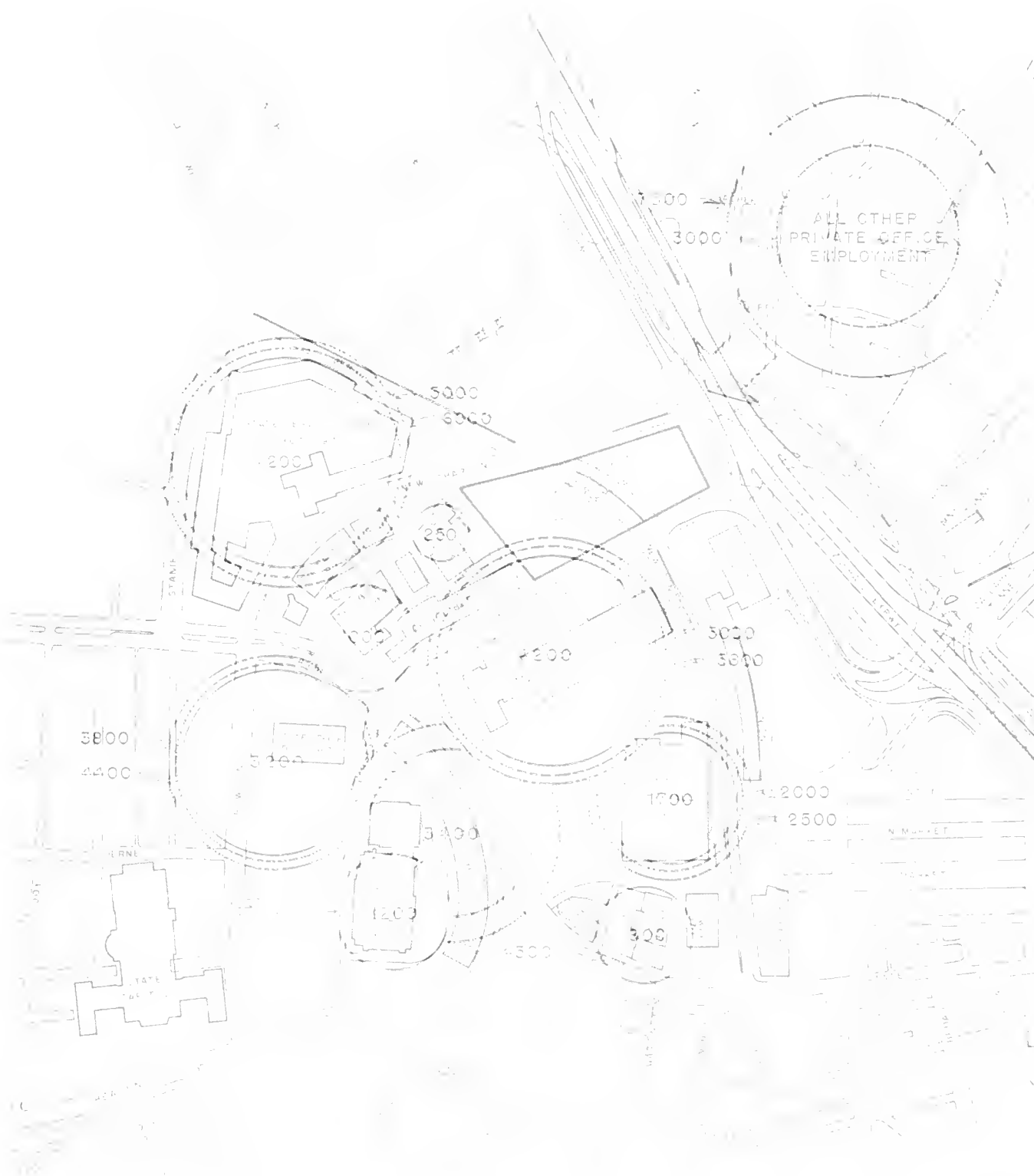
PROJECTED PARKING SUPPLY

It is anticipated that by 1967 there will be approximately 2,270 parking spaces available in, and adjacent to, the Government Center area exclusive of the proposed Government Center Garage. As shown in Figure 7 and Table 8, almost half of these anticipated spaces will be created in connection with new facilities which will be built in the area. When the available spaces are adjusted according to anticipated use (refer to the details shown in Table 8) it is estimated that approximately 1,000 of these spaces will be competitive with the proposed Government Center Garage in 1967.

It is estimated that during the period between 1970 and 1985 there will be 1,986 spaces available (exclusive of the proposed garage) and that these facilities will provide 910 competing spaces.

Many of the proposed federal, state, and city buildings scheduled for construction in the Government Center area will provide parking space. However, much of this space will be reserved for use by public agencies.

Figure 7 shows that the proposed Government Center Garage



EMPLOYMENT PROJECTIONS

EMPLOYMENT	TOTALS
1967	19950
1970	26550
1985	33950

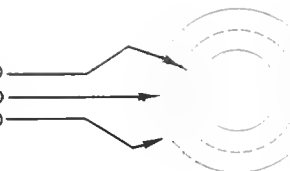




Table 8
ESTIMATED COMPETITIVE PARKING IN TRADE AREA, 1967 TO 1985

	Total Space Available	Competitive Space
<u>1967</u>		
Permanent Facilities	916	180
(Facilities are presently used to 90% of their capacity while containing 10% of the potential employees to the area..producing a 20% competitive market)		
Temporary Facilities (Remaining by 1967)	284	90
(Present use--90%, construction workers occupy 10% of space while potential employees occupy 10%..producing a 30% competitive market)		
New Facilities	1,070	730
Center Plaza-- 500 spaces 100% competitive		
Federal, State, City,--parking provisions--570 spaces (60% of space assumed to be used by government agency-owned cars..40% is available in the competitive market)		
Total, 1967:	2,270	1,000
<u>1970-1985</u>		
Permanent Facilities	916	180
New Facilities	1,070	730
Total, 1970-1985:	1,986	910

will be more centrally located with respect to employment concentrations and visitor destinations than a large proportion of the competitive parking space. This implies that if the rate structure in the proposed Government Center Garage is competitive, relatively few potential parkers would prefer to use the more remotely located alternate facilities.

ESTIMATED GARAGE USE

Garage use has been conservatively estimated through a process of assuming that all competitive parking facilities would be filled and that the remaining parkers would patronize the proposed garage. As summarized in Table 9, it is estimated that in 1967, with the developments anticipated in the area, there would be 1,880 parkers in the proposed garage during the average daily peak. In other words, the garage would be virtually filled in 1967--the first year of operation--although it has been assumed that all competitive space would be occupied first. During 1970 and subsequent years, the daily peak parking load in the garage would remain at 2,000 vehicles since this is the designed capacity of the structure.

On a day-long basis, considering turnover for the various types of parkers, it is estimated that the garage would accommodate 3,270 parkers in 1967 and 3,950 by 1970 and

Table 9
ESTIMATED GARAGE USE, 1967-1985

	1967	1970	1971-1985
<u>During Daily Peak</u>			
Estimated Parking Generation	2,880	3,990	5,220
Competitive Space	<u>1,000</u>	<u>910</u>	<u>910</u>
Net Potential Parkers	1,880	3,080	4,310
Parkers in Garage	1,880	2,000 ⁽¹⁾	2,000 ⁽¹⁾
<u>Daily Garage Parkers</u>			
Visitors (short-term)	1,640	1,380	1,380
Employees (long-term)	<u>1,630</u>	<u>2,570</u>	<u>2,570</u>
Total:	3,270	3,950 ⁽¹⁾	3,950 ⁽¹⁾

⁽¹⁾Garage parking based on 2,000 space capacity.

thereafter. Again, the day-long use of the garage is limited by its capacity.

It should be noted that in the years following 1970 there will be an estimated unsatisfied demand for parking space (demand exceeding the capacity of all anticipated parking facilities in the area, including the proposed Government Center Garage) amounting to 2,310 spaces during the daily peak period.

ECONOMIC ANALYSIS

One of the principal reasons for developing the Government Center Garage is to serve short-term parkers--usually persons visiting the area. In effect, this type of parker is to be served first and any surplus space would be devoted to employee or long-term parking. One way to achieve this pattern of usage in the garage is through the establishment of a fee structure which caters to the short-term parker. A suggested rate structure designed to accomplish this purpose for the years 1967 through 1970 is shown in Table 10. This schedule would be competitive with existing commercial facilities in, and adjacent to, the site of the Government Center Garage.

Table 10
RATE SCHEDULE FOR PROPOSED GARAGE

Duration	<u>Charge</u>	
	1967	1970
One Hour or Less	\$.50	\$.50
1 to 2 Hours	1.00	1.00
Additional Hour	.50	.50
Maximum--All Day	1.50	---
Monthly	25.00	30.00

A different fee structure is recommended for 1970 and subsequent years in order to discourage all-day parkers. Following 1970, it is anticipated that the demand for visitor parking will reach a point where relatively few employees can use the garage if visitors are to be adequately accommodated.

Revenue estimates for the proposed garage have been developed for the control years of 1967 and 1970. These estimates have been based on the following assumptions.

1. In 1970 there will be 1,880 parkers using the garage at the daily peak. By 1970, this will increase to 2,000 parkers.
2. The minimum number of spaces reserved for short-term parkers would be 600 in 1967, and this figure would increase to 900 by 1970. These figures are based on the anticipated daily demand for parking and the expected average turnover.
3. By 1970, 1,100 spaces would be reserved for long-term parkers. This number would be controlled by the sale of monthly stickers in order to assure that the specified number of short-term parking spaces would be available.

Accordingly, it is estimated that the Government Center Garage would realize an annual revenue of \$816,000 in 1967. The annual revenue is expected to increase to \$940,000 by 1970 and remain essentially level from that point on. Table 11 summarizes the gross revenue estimated for the garage in each of these years and indicates how much of the total would result from employee and visitor parkers.

Estimates of the maintenance and operating costs of the proposed garage have been prepared for the prime architect by Meyers Brothers who operate a number of parking facilities

Table 11
ESTIMATED GROSS REVENUES

	1967		1970	
	Daily Parkers	Annual Gross Income (1)	Daily Parkers	Annual Gross Income (1,2)
<u>Employees</u>				
Daily	820	\$289,000	--	--
Monthly	820	246,000	1,380	\$496,000
<u>Visitors</u>				
Daily	<u>1,630</u>	<u>281,000</u>	<u>2,570</u>	<u>444,000</u>
Total:	3,270	\$816,000	3,950	\$940,000

(1) Assumes operation on weekdays only during normal business day.

(2) If more than 2,000 spaces were provided, estimated use and revenue would be greater by 1970.

of a similar nature in the Boston area and elsewhere. The parking operations consultant estimates that maintenance and operating costs for the garage will be approximately \$110,000 annually. These estimates are predicated on the structure and its operation as described in the previous section "Description of the Garage" in Chapter 1 of this report.

When the anticipated maintenance and operating costs are deducted from the estimated gross annual revenues, annual net revenues are estimated at \$706,000 in 1967 and \$830,000 by 1970. It is anticipated that net revenues would remain essentially level from this point on, assuming a continuation of the previously described rate structure and operating costs. If operating costs were to increase somewhat in subsequent years, it is presumed that parking charges would be increased commensurately, so it appears realistic to expect net revenues to remain essentially stable. Estimated annual revenue and costs are summarized in Table 12.

Table 12
ESTIMATED ANNUAL REVENUE AND COSTS

	1967	1970
Gross Annual Revenue	\$816,000	\$940,000
Maintenance and Operating Costs	110,000	110,000
Net Revenue	<u>\$706,000</u>	<u>\$830,000</u>

Estimated development cost of the proposed Government Center Garage is \$7,280,000. (See Table 13.) This cost includes land acquisition, construction cost, and the architectural fee.

It is anticipated that the Government Center Garage will be financed with 20-year general obligation bonds bearing $3\frac{1}{4}$ percent annual interest. The annual level debt service would amount to \$500,000.

When the anticipated level debt service for garage development is deducted from the estimated net revenue, the annual surplus in 1967 is placed at \$206,000. By 1970 the annual surplus is expected to increase to \$330,000. (See Table 14.) The debt coverage ratio, or the ratio of the net annual revenue divided by the level debt service, would amount to 1.41 in 1967 and would increase to 1.66 by 1970. These estimates indicate that the project would be entirely feasible.

Table 13
ESTIMATED DEVELOPMENT COST

Spaces	2,000
Land Acquisition	\$ 820,000
Maximum Construction Cost	6,000,000
Architects Fee(1)	360,000
Additional Engineering, (1)	
Boring, and Testing Fees	100,000
Total Cost	<u>\$7,280,000</u>
Cost per Space	3,640
Annual Debt Service(2)	500,000

(1) Based on architect's contract for six percent of construction cost plus allowances for special studies, borings, etc.

(2) Based on 20-year general obligation bonds at a $3\frac{1}{4}$ percent interest rate.

Table 14
ECONOMIC SUMMARY FOR 1967 and 1970

	1967	1970
Net Revenue	\$706,000	\$830,000
Level Debt Service	<u>500,000</u>	<u>500,000</u>
Surplus	\$206,000	\$330,000
Debt Coverage Ratio	1.41	1.66

4 NON-PARKING GARAGE USES

BUS TERMINAL

CONSTRUCTION in the Government Center area will necessitate shifting the present Haymarket Square Bus Terminal to a new terminal to be incorporated in the east end of the proposed Government Center Garage. Refer to Figure 3 for a schematic perspective of the garage indicating the bus terminal location.

The bus terminal at Haymarket presently accommodates approximately 4,800 one-way person trips per day from the Eastern Massachusetts and MBTA bus lines. During the peak period approximately 40 buses arrive at Haymarket Square, and 24 to 30 buses pass through Haymarket on the North Station and South Station bus lines. The proposed routing in the new bus terminal for the four bus lines which will be affected is shown in Figure 8.

Figure 8 also shows the four subway stations located in, and adjacent to, Government Center. In the future, the Government Center area will be served by these stations. Although it is likely that these figures will change, approximately 27,700 one-way trips were recorded at these stations during 1963.

Approximately 60 percent of the persons who will work or visit the Government Center area are expected to use public transportation. It is possible that by 1970 approximately 30,000 persons will travel to the Government Center area by public transportation.

ACCESSORY USES

It has been suggested that two types of accessory uses might be incorporated in the proposed Government Center Garage. One of these, which incorporated a theatre, a restaurant, and a health club on the roof of the garage, has been



PROPOSED BUS AND TRANSIT OPERATION



 - SUBWAY STATION ENTRANCE
  - SUBWAY LINE
  - BUS ROUTES

abandoned. However, before the scheme was abandoned, a preliminary estimate of the potential revenue that such facilities might generate was prepared. In brief, it was concluded that these developments could produce a maximum gross revenue of approximately \$150,000 to \$300,000 per year, including rental of the space and additional parking which might be generated by these activities.¹ The parking generated by the development could conflict with the other employee and visitor parking needs.

An additional accessory use can take place in approximately 1,200 square feet of space that may be provided near the central pedestrian area which was described in the section "Description of the Garage" in Chapter 1. The types of activities that are appropriate for this area include a newsstand, a flower shop, or similar impulse or convenience shopping activities that can be operated in a small area. It is anticipated that this type of operation could produce a gross rent of between \$5,000 and \$10,000 per year. Added garage revenues of this general range would have little effect on the economic aspects of the project and, therefore, were not included in the summary presented in Table 14.

¹The assumed developments included a 1,200-seat theatre, a 500 seat restaurant including a cocktail lounge and coffee shop, and a health club accommodating 100 people an evening. It was estimated that the added cost to strengthen the foundation of the garage to permit this development would amount to about \$350,000.

PARTICIPATING PROFESSIONAL STAFF OF BARDON-ASCHEMUN ASSOCIATES

Jean M. Keneipp, Project Director
Neil S. Kenig, Engineering Associate

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